CLAIMS:

1. In a charge pump of the type including a plurality of stages, each stage comprising an input and an output, an energy injection capacitor and a control capacitor, the improvement comprising:

a) a first clock signal having a first voltage swing, the first clock signal being applied to the energy injection capacitors of each of the stages; and

b) a second clock signal having a second voltage swing greater than the first voltage swing, the second clock signal being applied to the control capacitor of at least one of the stages.

2. The charge pump as in claim 1, wherein the second voltage swing of the second clock signal is sufficient to compensate for threshold voltage losses in the stages to which it is applied.

3. The charge pump as in claim 1, wherein the second clock signal is applied to a subset of the stages and the first clock signal is applied to a remainder of the stages.

4. The charge pump as in claim 1, wherein the first clock signal includes two distinct pulse trains having respective first and second phases, and wherein the second clock signal includes two distinct pulse trains having respective first and second phases.

5. The charge pump as in claim 4, wherein the first and second phases of the first

clock signal have non-overlapping pulse durations, and wherein first and second phases of the second clock signal have non-overlapping pulse durations.

6. The charge pump as in claim 1, wherein an operative portion of the first phase of the first clock signal coincides with an operative portion of the first phase of the second clock signal, and wherein an operative portion of the second phase of the first clock signal coincides with an operative portion of the second phase of the second clock signal.

7. The charge pump as in claim 6, wherein the operative portion of the first phase of the first clock signal envelops the operative portion of the first phase of the second clock signal, and wherein the operative portion of the second phase of the first clock signal envelops the operative portion of the second phase of the second clock signal.

8. The charge pump as in claim 1, further comprising at each stage a charge transfer transistor and a controlling transistor, wherein:

(a) the energy injection capacitor has a first terminal coupled to the output of a given stage and the input of a subsequent stage and has a second terminal coupled to the first clock signal,

(b) the charge transfer transistor has three terminals including a first terminal coupled to a third terminal of the control transistor, a second terminal coupled to the input of the given stage, and a third terminal coupled to the output of a given stage,

(c) the controlling transistor has three terminals including a first terminal

coupled to the output of a given stage, a second terminal coupled to the input of a given stage and the third terminal coupled to a first terminal of the control capacitor and also to the first terminal of the charge transfer transistor, and

(d) the control capacitor has a second terminal coupled to the second clock signal.

9. The charge pump as in claim 8, wherein all of the transistors in a given stage are either n-mos devices or p-mos devices.

10. The charge pump as in claim 9, wherein the charge transfer transistor and the controlling transistor are MOS devices, and wherein the first, second and third terminals of the MOS devices are the gate, source and drain terminals, respectively.

11. The charge pump as in claim 1, wherein the charge pump is either a positive charge pump or a negative charge pump.

12. A method for overcoming increasing bulk effect in successive stages of a charge pump by applying in a given stage an energizing voltage to an energy injection capacitor while applying a comparatively greater voltage to a control capacitor.